



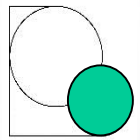
DSMCS



UNIVERSITÀ  
DEGLI STUDI DI TRIESTE  
*Dipartimento di Ingegneria e Architettura*



DIPARTIMENTO DI  
SCIENZE DELLA VITA



BURLO

**Mercoledì 27-9 ore 15.00**

*Aula Rita Levi Montalcini*

*Ospedale Universitario di Cattinara*

***Presentazione dei risultati del lavoro:***

**A novel approach based on low field nuclear magnetic resonance for the detection of the pathological components of sputum in cystic fibrosis patients**

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**ABSTRACT**

Purpose: development of a reliable/simple method to monitor lung condition in cystic fibrosis (CF) patients. Lung functionality assessment in CF patients is relevant as the majority of them still die of respiratory failure. In lung mucus (sputum) of CF patients, components such as proteins, biopolymers, DNA, bacteria and mucin are pathologically increased. As lung functionality is related to the amount of the pathological components in the sputum, their determination can help clinicians in monitoring lung condition and planning therapy.

Methods: low field nuclear magnetic resonance (LF-NMR) was used to evaluate the variation of the relaxation time (T2m) of the water hydrogens present in CF sputum in relation to the amounts of the pathological components. LF-NMR was tested in artificial samples (mucin or alginates), then in conditional sputum (saliva from healthy volunteers, added by different amounts of the pathological components) and finally in 12 patient's sputum where T2m was correlated to a commonly used lung monitoring test, i.e. forced expiratory volume in the first second (FEV1).

Results: T2m significantly ( $P < 0.05$ ) differed between samples with and without pathological components and between healthy and CF patients ( $P < 0.05$ ) where T2m correlated ( $r = 0.87$ ) with FEV1.

Conclusion: the method presented can potentially become a valuable lung-monitoring tool in CF patients as well as in other chronic inflammatory lung diseases.